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September 6, 2006

## BY ELECTRONIC MAIL

Patrick Morris  
Senior Water Quality Control Engineer  
California Regional Water Quality Control Board  
Central Valley Region  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

Dear Mr. Morris:

I am writing in response to your request of August 30, 2006 to provide additional information on my peer review of the draft water quality control plan for methylmercury in the Sacramento-San Joaquin Delta. Specifically, you asked me to elaborate on the scientific validity of the proposal to require studies to further characterize methylmercury loads and to develop control practices for methylmercury from managed wetlands, agricultural runoff and urban runoff.

I did not comment on these approaches specifically in the review that I sent to you on August 8 because I interpreted my charge to be related to only the scientific portion of the review and I interpreted the approach of waiting until additional research was completed as a policy decision. However, upon reflection I agree with you there are some scientific issues underlying this approach that are appropriate for me to include in my review. In the following paragraphs I have summarized some of my thoughts on these issues.

The first scientific question is related to whether available data can be used to accurately determine the contributions of methylmercury from managed wetlands, agricultural runoff and urban runoff. The staff members have attempted to quantify these sources in the draft plan. The estimates of loading from these three classes of methylmercury sources are based on a very limited data set and have considerable uncertainty. Therefore, I agree with the staff's decision to require the collection of additional data to obtain better estimates of the loading from non-point sources. The approach for obtaining additional data is not described in detail, so I am unable to assess the likelihood that the data collected during the study period will establish precise methylmercury load estimates. Data on methylmercury fluxes from these diverse sources are likely to be difficult to obtain and I expect that there still will be uncertainty in the estimates after additional data collection. To increase the likelihood that the data will be useful to future load estimates I suggest that any additional plans for data collection be subjected to peer review.

The second question is related to whether or not there are adequate data to assess the costs and efficacy of various control options. The decision to regulate methylmercury loads from these three types of sources sets new precedent and there is not a lot of experience on how to

accomplish this objective. I agree with the staff that there currently is not enough information to design effective control strategies or to estimate the costs of such strategies. For example, the staff reports on the first year of a Calfed study indicating different mercury methylation rates from test wetland cells. One year of unpublished data from one site is not sufficient for drawing conclusions about the likelihood of success or costs of larger restoration projects. At this point, it is difficult to know if methylmercury production really can be minimized by wetland designs. About all that can be said at this point is that wetlands probably make more methylmercury than unrestored land. Without additional research, it seems likely that the only control strategy for methylmercury in restored wetlands would be not to restore wetlands. If this is the effect of requiring that restored wetlands do not increase methylmercury loadings, I believe that this decision should be made in light of the benefits to the ecosystem associated with habitat restoration.

Similar issues are likely to be encountered in association with agricultural runoff and stormwater runoff. I agree with the staff that the planned collection of data on methylmercury concentrations in agricultural drains and runoff will be useful to establishing a mass balance. However, I am uncertain that cost-effective approaches for reducing methylmercury concentrations will be developed during the study period. It is likely that any approaches that are developed will be limited to specific types of soils and crops, thereby necessitating site-specific studies prior to selection of control approaches. Likewise, quantification of mercury and methylmercury in stormwater is likely to be challenging due to the potential for sample contamination and the variability of flows within storms.

In conclusion, I believe that the staff has employed a sound approach to implementing the TMDL in a stepwise fashion that is consistent with the principles of adaptive management, which was recommended by the National Academies in their review of the TMDL process. After completion of the planned studies it is likely that the staff will be in a better position to assess methylmercury loading and the costs associated with control activities. However, the estimates of methylmercury loads from these sources and the cost-effectiveness of various control strategies will always have considerable uncertainty.

Sincerely,

David L. Sedlak  
Professor